EXHIBIT 2

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

VENTANA MEDICAL SYSTEMS, INC.,

Plaintiff,

vs.) Civil Action No. 04-1522 (GMS)

DAKOCYTOMATION CALIFORNIA, INC.,

Defendant.

VIDEO DEPOSITION OF: SCOTT LEON

CONFIDENTIAL

PURSUANT TO NOTICE, the above-entitled deposition was taken on behalf of the Plaintiff at 4850 Innovation Drive, Fort Collins, Colorado, on January 6, 2006, at 9:44 a.m., before Cheryl A. Palmer, Registered Professional Reporter and Notary Public.

A Correct.
Q And that air comes out of a plenum, is that right?
A Correct.
Q That plenum moves, correct?
A Correct.
Q It moves back and forth across the slide clip walls, correct?
MR. ZELIGER: Objection to the form of the question, but you may answer.
THE WITNESS: Could you repeat what you said? It doesn't move the way you described it.
Q (By Mr. Reed) Will you describe for me the motion of the plenum?
A It's back and forth above the slide clip. It's not -- I think you said on top of. It's above it.
Q Okay. And it goes -- I'm not sure which orientation we want to go, front to back --
A Front to back.
Q Okay. Towards the center and then towards the outside of the carousel, right?
A Correct.
Q And we talked about the portion of the slide bounded by the slide clip as being where the sample is and the reagents are, right?

A Correct.
Q And the plenum travels above that area?
A It does.
Q Radially, correct?
A Back and forth.
Q In a typical mixing step how many times, how many passes will it make?
A From one to four or five, somewhere in that -- they're all different, but I know typical is probably two or three.
Q More than one?
A On average it's more than one.
Q The air flows from that air mixer when the plenum moves, right?
A Correct.
Q When there are multiple passes is there a pause in between them?
A A slight -- I would have to look at the -- I would have to look at the code to see whether there's a pause, because the motion is a distinct -- and in software terms one stroke is one distinct motion, and then when you add more than one motion there could be a pause in between as the computer is getting the message to do more than one.
But it's not designed -- it doesn't -- to the

eye it doesn't stop. It just goes back and forth.

Q Does the air flow stop in between passes?

A I don't know. I don't believe so.

Q Is there anybody at Dako here today that would know the answer to that question off the top of their head?

A Not here today. I would have to have somebody review the code to see whether it actually stops, whether there's a break. I don't believe that there is a break, but I would have to get confirmation of that.

Q The air mixer includes this plenum and there is an orifice coming out of the plenum, right?

A No.

Q Or in the plenum?

A It's not an orifice. It's a slit.

Q A slit, a hole?

A It's not a hole. It's a slit. It's not a cylindrical hole. It's a slit. It's a 10 to 20 thousandths wide slit.

Q 10 to 20 thousandths of what?

A Of an inch.

Q Okay. About how long is it?

A About -- guessing, maybe 300 thousandths of an inch, .3 inches.

Q .3 inches?
A Roughly.
Q Okay. And that slit is centered in the plenum?
A I believe so, yes.
Q The plenum also -- a portion of the plenum acts as a sensor -- excuse me, as a flag for a sensor that's part of the mixer assembly, right?
A That's correct.
Q The air flow is specified to be between nine and 10 standard cubic feet per hour, correct?
A That's correct.
Q The mixer includes -- the mixer assembly includes a stepper motor?
A Yes.
Q I'm going to ask you to turn in the service manual to Page 103.
A (Complied)
Q Before I ask you a question about that page, the mixer assembly receives a supply of air from a pump, right?
A Correct.
Q That air comes through tubing to the plenum, right?
A It goes through tubing that goes through some

EXHIBIT 3

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

VENTANA MEDICAL SYSTEMS, INC., Plaintiff, v. DAKOCYTOMATION CALIFORNIA INC., Defendant.	C.A. No. 04-1522-GMS

EXPERT REPORT OF DR. WILLIAM L. MANION

Dated: February 1, 2006

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Attorneys for Defendant
DakoCytomation California Inc.

The scope and content of the prior art

a. Gibbs et al. (U.S. Pat No. 3,854,703)

Gibbs et al. teaches a device that mixes specimen materials with reagents on top of a elongated support surface to promote chemical reactions in liquid mixtures. (Col. 2, lines 5-9). The liquid mixture is agitated by directing a jet of gaseous fluid from a supply duct outlet at a reagent pool to induce a vortex motion and thereby producing a through mixing of the reacting components. (Col. 3, lines 37-43). The elongated support surface has discrete reagent agitation zones where reagents are added and mixed. The air mixer disclosed in Gibbs et al. is composed of at least one air stream and one nozzle. *Id.* The air mixer is at times next to, but not above or beneath the reagent agitation zone. *Id.* One of the stated advantages of the Gibbs mixing device is to mix very small samples without causing cross-contamination between samples. (Col. 1, lines 14-20).

I believe Gibbs et al. is pertinent prior art because one of ordinary skill in the art trying to find a device to agitate liquids on planar surfaces would find the Gibbs et al. reference.

b. Sakurada (U.S. Pat No. 4,346,056)

Sakurada discloses an automatic reaction apparatus having a reagent carousel containing a plurality of reagent containers; a homing and indexing device for identifying a home position (original point signal) for the reagent carousel and for identifying relative positions of each reagent container based on the subsequent movements of the drive motor from the home position; and a drive motor for rotating the carousel and positioning a preselected reagent container in a reagent supply zone. (Col. 5, line 22 – col. 6, line 22; Figs. 5-8). Additionally, Sakurada teaches the use of a reaction carousel.

I believe Sakurada is pertinent prior art because one of ordinary skill in the art trying to find a device to dispense reagents would find the Sakurada reference.

this where the examiner appeared to issue the patent based on faulty information from the applicant.

IX. DEMONSTRATIVES

I reserve the right to use demonstratives, such as animations, to assist me in explaining my opinions and assist the Court and jury in understanding them.

X. ADDITIONAL OR AMENDED OPINIONS

I reserve the right to augment or amend my opinions in the event that I become aware of new or different information, including prior art, or in the event that the Court provides additional or different claim constructions.

XI. DECLARATION

In compliance with 28 U.S.C. § 1746, and the laws of the State of New Jersey, I declare under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge. Executed in Medford, New Jersey, this 31st day of January, 2006.

William L. Marion

EXHIBIT 4

United States Patent [19]

Gibbs et al.

[11] **3,854,703**

[45] **Dec. 17, 1974**

[54] **METHOD OF AND APPARATUS FOR PROMOTING A REACTION BETWEEN A LIQUID SPECIMEN AND A LIQUID REAGENT**

[75] Inventors: **Dudley Francis Gibbs**, Bracknell; **Edward John Bennet**, Wokingham; **William Ian Hopkinson**, Camberley, all of England

[73] Assignee: **Vickers Limited**, London, England

[22] Filed: **Sept. 15, 1972**

[21] Appl. No.: **289,344**

[30] **Foreign Application Priority Data**

Sept. 17, 1971 Great Britain 43575/71
Mar. 30, 1972 Great Britain 15218/72

[52] U.S. Cl. 259/11, 23/259, 259/2, 259/DIG. 24

[51] Int. Cl. B01f 13/02

[58] Field of Search .... 259/1 R, 2, 11, 17, DIG. 17, 259/DIG. 24; 23/253 TP, 259; 261/80; 34/28, 31, 33, 46, 216, 217, 221, DIG. 2

[56] **References Cited**

UNITED STATES PATENTS

2,099,160	11/1937	Charch	34/31 X
2,678,504	5/1954	Knopp	34/DIG. 2
2,927,363	3/1960	Park	34/46 X

FOREIGN PATENTS OR APPLICATIONS

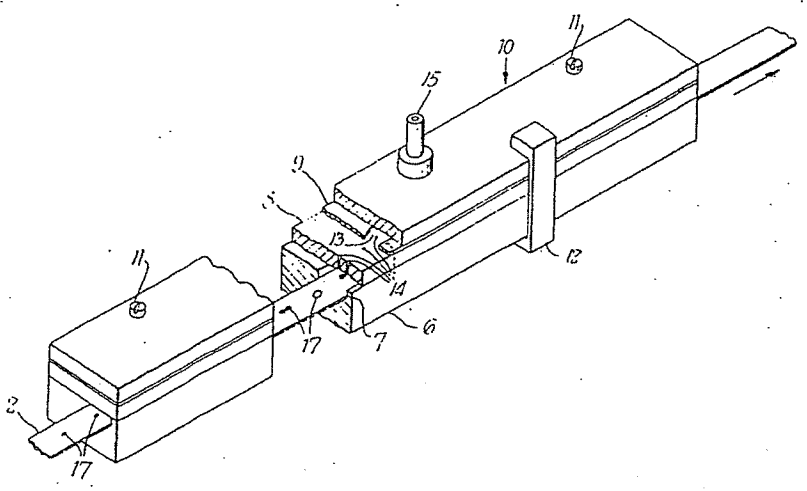
2,007,036	1/1970	France	259/2

Primary Examiner—Harvey C. Hornsby
Assistant Examiner—Alan Cantor
Attorney, Agent, or Firm—Pennie & Edmonds

[57] **ABSTRACT**

A reaction between a liquid specimen and a liquid reagent is promoted by applying the liquids to a liquid-impermeable support surface to form a mixture thereon, and the liquid mixture is agitated by directing a jet of gaseous fluid from a supply duct outlet to impinge thereon, and bringing about relative movement between the outlet and the support surface.

10 Claims, 6 Drawing Figures



PATENTED DEC 17 1974

3,854,703

SHEET 1 OF 3

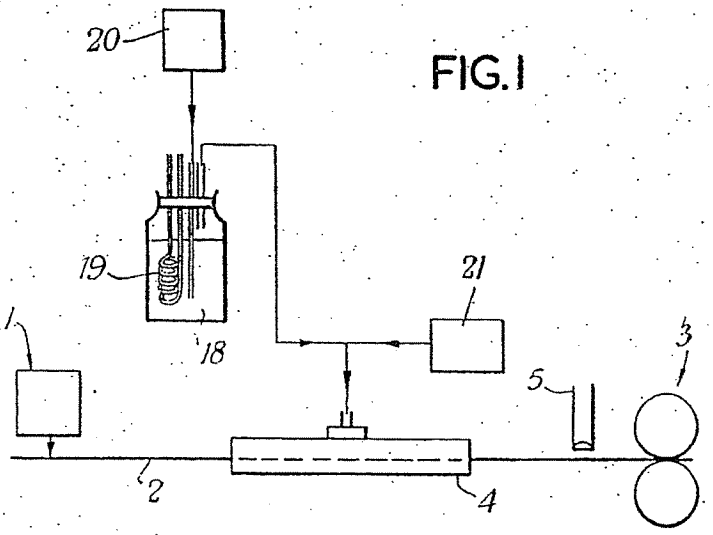
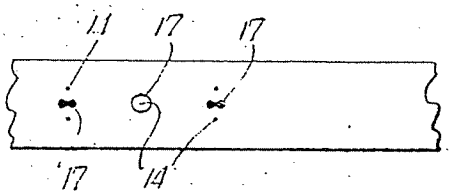


FIG.1

FIG.3



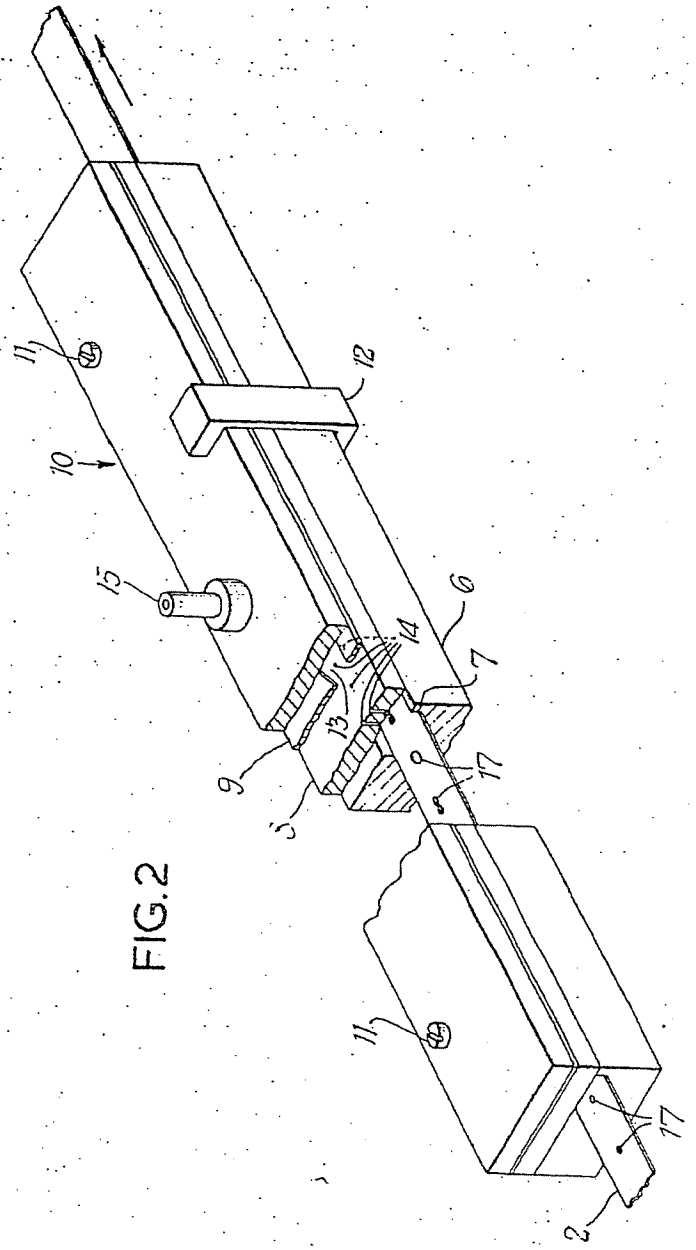


FIG. 2

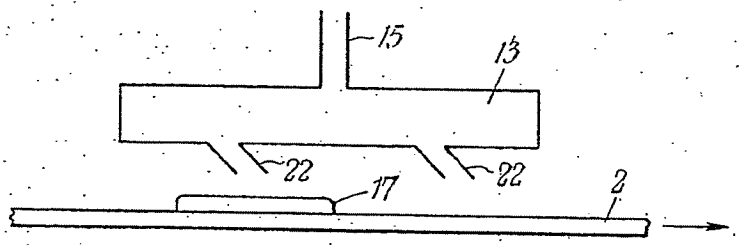


FIG.4

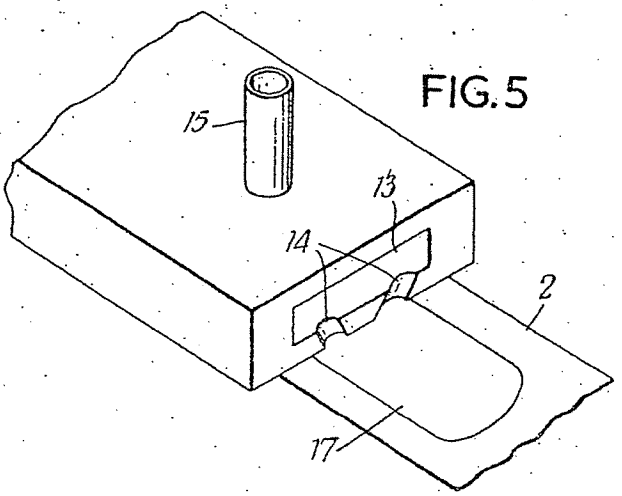
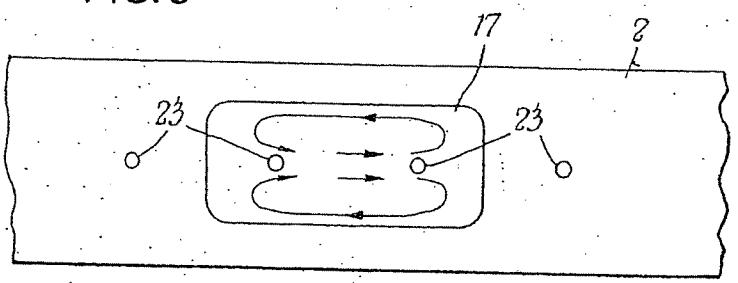


FIG.5

FIG.6



METHOD OF AND APPARATUS FOR PROMOTING A REACTION BETWEEN A LIQUID SPECIMEN AND A LIQUID REAGENT

This invention relates to methods of and apparatus for promoting a reaction between a liquid specimen and a liquid reagent.

Many tests that are carried out upon samples of specimen material derived from different sources involve agitating the material with a reagent added thereto in order to produce an homogeneous mixture of the reagent and the material. This has been achieved hitherto by stirring the material with a stirring rod. However, it is inconvenient to employ a stirring rod with very small samples, and cross-contamination between samples may be caused if a stirring rod is employed. Accordingly the problem has arisen of how to bring about agitation of very small samples of specimen material, and particularly without causing cross-contamination between samples.

According to a first aspect of the present invention there is provided a method of agitating liquid specimen material distributed for examination over a specimen support surface, wherein a jet of gaseous fluid emerging from a supply duct outlet is caused to be incident upon the liquid material and relative movement is brought about between the support surface and the said supply duct outlet.

According to a second aspect of the present invention there is provided, in combination, a specimen support surface and a supply duct arranged for directing a jet of gaseous fluid from an outlet of the duct to be incident upon liquid specimen material that is distributed for examination over the support surface when it is in use, there being means for bringing about relative movement between the support surface and the said outlet so as to cause agitation of the liquid specimen material.

According to a third aspect of the present invention there is provided a device for agitating liquid specimen material distributed along an upper surface of an elongate specimen support, comprising guide means for determining a path along which the support can be moved in a lengthwise direction thereof through the device, and pneumatic jet-forming means having at least one outlet arranged, adjacent to the said guide means, for directing a jet of gaseous fluid so as to be incident upon the specimen material on the support surface, when the device is in use, thereby to bring about agitation of the specimen material as the specimen support is moved, along the said path, past the or each said outlet.

The gaseous fluid (i.e., gas or vapour) is preferably air.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:

FIG. 1 shows diagrammatically an elevation of apparatus for use in testing specimen materials,

FIG. 2 shows a perspective view, partly cut away, of a device forming part of the FIG. 1 apparatus,

FIG. 3 shows a plan view of a portion of specimen support tape,

FIG. 4 shows diagrammatically a longitudinal sectional view of a first modification of the FIG. 2 device,

FIG. 5 shows a perspective view, cut away, of a second modification of the FIG. 1 device, and

FIG. 6 shows a plan view of a portion of specimen support tape.

The apparatus shown in FIG. 1 is used to perform tests upon specimen materials, for example blood serum, by mixing a sample of each specimen material with reagent and observing the result of the reaction, if any, between the specimen material and the reagent. Thus, the apparatus comprises applicator means 1 whereby a succession of drops of reagent (and possibly also diluent) are applied to the upper surface of a horizontal specimen support tape 2 which is drawn through the apparatus by virtue of its being gripped between two rollers 3 of which one is driven to rotate. The applicator means 1 also dispense a drop of specimen material into each drop of reagent, to provide a succession of pools distributed along the tape and each containing specimen material and reagent. Beyond the applicator means 1 in the direction of tape movement is a pneumatic stirring device 4 whereby each pool of specimen material and reagent is thoroughly agitated to provide an homogeneous mixture. The pneumatic stirring device is shown in more detail in FIG. 2. During passage of the pools through the pneumatic stirring device the reaction, if any, between the specimen material and the reagent takes place, and the result of the reaction is observed by optical means 5.

The pneumatic stirring device illustrated in FIG. 2 comprises a tape guide 6 formed with a groove 7 which has a flat bottom and straight sides. A distribution block 8 is positioned above the guide 6 so that it extends completely over the top of the groove 7. Above the distribution block 8 is a gasket 9 and above that is a manifold top plate 10. The components 8, 9 and 10 are held together by screws 11 and the guide 6 and the assembly 8/9/10 are held together by a spring clamp 12.

The block 8, the gasket 9 and the top plate 10 together define a chamber 13 which extends above the groove 7. The chamber 13 communicates with the volume bounded by the groove 7 through a plurality of outlets 14. Air from a supply cylinder 20 (FIG. 1) can be supplied under pressure to the chamber 13 through an inlet stub 15 provided on the top plate 10, and it leaves the chamber by way of the outlets 14 forming respective jets directed towards the bottom of the groove. The outlets 14 along the groove are arranged alternately as outletpairs and single outlets.

The device 2 is used to agitate pools 17, containing specimen material and reagent, distributed along the upper surface of the specimen support tape 2. To use the device the clamp 12 is removed and the assembly 8/9/10 is lifted from the guide 6 so as to expose the groove 7. A lead-in portion of the tape is laid in the groove and the assembly 8/9/10 is then clamped in position once more. The leading end of the tape is passed between the rollers 3 for drawing the tape through the groove in the direction of the arrow, and the inlet stub is connected to a supply of compressed air (not shown). The tape is then drawn through the device, along the path defined by the groove in the guide, as the air is supplied to the chamber and issues from it through the outlets 14 forming jets directed onto the upper specimen-bearing surface of the tape. As a pool of the specimen material passes under one of the single outlets that pool tends to be flattened out and pushed

aside from the centre of the tape, and as the pool subsequently passes under an outlet-pair the pool is pushed back once more towards the centre of the tape (see FIG. 3). Thus as the tape is drawn through the device the specimen material is agitated. The amount of agitation is controlled by the total number of single outlets and outlet-pairs, while the rate of agitation is controlled by the pitch of the single outlets and outlet-pairs along the groove.

The agitation brought about by the FIG. 2 device is used to promote chemical reactions between the specimen material and the reagent, and in order to prevent excessive drying of the reactants and/or the reaction product the air is humidified by passing the air from the cylinder **20** through a bath **18** (FIG. **1**) of water and mixing it with dry air from a second cylinder **21.** The temperature of the air is also controlled by heating the water of the bath **18** with a thermostatically controlled immersion heater **19.** It may in some circumstances be desired to dry the reaction product, in which case the temperature and humidity of the air are adjusted accordingly. The specimen material may contain insufficient liquid in which case diluents as well as reagents may be added to the specimen material before it reaches the device.

A device in accordance with FIG. **2** has been constructed using Perspex for the components **6, 8** and **10** and butyl rubber for the gasket **9.** A satisfactory amount of agitation was achieved with the device using air supplied to the inlet stub **15** at about 5 p.s.i.

It has been found that instead of using alternate single outlets and outlet-pairs, as described with reference to FIGS. **2** and **3,** it is preferable in order to produce an homogeneous mixture of reagent and specimen material to employ the modification shown diagrammatically in FIG. **4.**

In the case of the FIG. **4** modification, two single outlets provided by jet needles **22** are spaced apart along the groove, without an interposing outlet-pair. The needles **22** are of cylindrical cross-section, and their central axes are inclined to the vertical at 45° but lie in the same vertical plane. The inclined needles are directed forwardly, that is in the direction of tape movement, and air jets provided by the needles induce a vortex motion in the liquid of the pools, thereby producing a thorough mixing of the reacting components. The depth of the groove is such that the clearance between the needles and the free surface of a pool 0.2 mm deep is less than five times the internal diameter of the jet needles. It is found with 10 μl pools containing blood serum and a water-based reagent, and a tape speed of 10 mm/sec., adequate mixing is produced with an air flow to each jet needle of approximately 0.6 l/min. The effectiveness of the jet action is reduced if the clearance between the needles and the pools is increased beyond five needle diameters or if the inclination of the needles to the vertical is reduced below 45°.

Many tests in serology involve agglutination reactions, developed by rocking a mixture of blood serum and a reagent for a period of time. If the mixture is provided in the form of pools on the horizontal tape **2,** the rocking action can be produced by passing the tape under a series of outlet-pairs as shown in FIG. **5.** In the case of FIG. **5** the outlets are provided by respective passageways of cylindrical cross-section. The central axis of each passageway is inclined to the vertical at 30°, and lies in the same vertical plane, perpendicular to the direction of tape movement, as the central axis of the passageway providing the other outlet of the pair. The two jets provided by the outlet-pair converge to form an air curtain above the tape which causes the liquid to be carried towards the back of the pool until it finally passes through the air curtain to flow forward again. The outlet-pairs are spaced apart along the groove by slightly more than the length of the pools in order to allow this pattern of movement to become established. For example, in the case of pools 12 mm long the outlet-pairs are spaced apart along the groove by 15 mm. The outlets are approximately 4 mm above the tape, and for 10 μl pools an air flow through each outlet-pair of approximately 0.6 l/min. is required.

Using the modification shown in FIG. **5** for reactions which require long mixing times and a large number of rocks leads to an undesirably long rocking stage, and in these circumstances it has been found preferable to employ a series of stirring jets as described with reference to FIG. **4,** with a pitch (space between successive jets) less than the length of the pools on the tape. For example, for a 10 μl pool, 12 mm long, the jets are pitched at 8 mm. This creates a steady vortex flow pattern in the pools, as shown in FIG. **6.** In FIG. **6** the positions at which the air jets are incident on the pool **17** and the tape **2** are shown as circles **23.** For 10 μl pools an air flow to each jet of 0.3 l/min. is sufficient. Of course, to increase the amount of mixing the tape speed may also be reduced.

It is not essential for the specimen material to be in discrete pools, as shown, but it could instead be in the form of a continuous trace extending along the tape.

The device shown in FIG. **2,** or as modified in accordance with FIGS. **4** or **5,** may be used in combination with other devices to treat specimen material to prepare it for subsequent microscopic examination, for example in the Vickers Cytological Screening Apparatus.

We claim:

1. A method of promoting a reaction between a liquid specimen and a liquid reagent, comprising the steps of applying the liquid specimen and the liquid reagent to a liquid-impermeable support surface to form a liquid mixture thereon, causing a jet of gaseous fluid to emerge from a supply duct outlet and impinge upon the liquid mixture on the support surface, and bringing about relative movement between the support surface and said supply duct outlet thereby to cause agitation of the liquid mixture.

2. A method as claimed in claim **1,** comprising the further steps of controlling the temperature and controlling the humidity of said gaseous fluid.

3. Apparatus for promoting a reaction between a liquid specimen and a liquid reagent; comprising a liquid-impermeable support surface, first means for applying the liquid specimen to the support surface, second means for applying the liquid reagent to the support surface to form thereon a liquid mixture with the liquid specimen, a source of gaseous fluid, a supply duct having an inlet connected to said source and an outlet arranged to direct a jet of gaseous fluid from said source to impinge upon said liquid mixture on the support surface, and drive means connected to bring about relative movement between the support surface and said outlet thereby to cause agitation of the liquid mixture.

4. Apparatus as claimed in claim **3,** further comprising means for controlling the temperature of said gase-

ous fluid and means for controlling the humidity of said gaseous fluid.

5. Apparatus as claimed in claim 3, wherein said support surface is an upper surface of an elongate specimen support and the apparatus further comprises guide means determining a path along which said support is movable in a longitudinal direction thereof through the apparatus.

6. Apparatus as claimed in claim 5, wherein said outlet is one of a plurality of such outlets all connected by way of the supply duct to said inlet and spaced apart along the path without additional outlets therebetween, each outlet of the plurality defining the end of a cylindrical passageway having a central axis lying in vertical plane parallel to said path and extending from said outlet both downwardly, at 45° to the vertical, and in said longitudinal direction.

7. Apparatus as claimed in claim 6, wherein said first and second means are arranged to co-operate to provide on said upper surface as said drive means operate a succession of pools of given depth, distributed along said upper surface and each containing a mixture of liquid specimen and liquid reagent, which are carried on the specimen support from said first and second means and subsequently along said path, and there being between each outlet of the plurality and the upper surface of said support a clearance that is less than the sum of said given depth and five times the internal diameter of said cylindrical passageways.

8. Apparatus as claimed in claim 7, wherein the number of outlets of the plurality is more than two and the distance between successive outlets is less than the length of said pools.

9. Apparatus as claimed in claim 5, wherein said outlet is one of a plurality of such outlets which are connected to said inlet and which are distributed along said path, the outlets being arranged alternately singly and in pairs, the two outlets of each pair being spaced apart transversely with respect to said path.

10. Apparatus as claimed in claim 5, wherein said first and second means are arranged to provide on said upper surface a succession of pools of given length distributed along said upper surface and each containing a liquid specimen and a liquid reagent, and said outlet is one of a plurality of such outlets, said outlets being arranged in pairs and the pairs of outlets being spaced apart along said path by a distance greater than said given length and there being no additional outlets between successive pairs of outlets along the path, each outlet of each pair defining the end of a cylindrical passageway having a central axis which is inclined to the vertical and lies in a vertical plane perpendicular to said path and which crosses the central axis of the cylindrical passageway whose end is defined by the other outlet of the pair below the pair of outlets.

* * * * *

EXHIBIT 5

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

VENTANA MEDICAL SYSTEMS, INC., Plaintiff, v. DAKOCYTOMATION CALIFORNIA INC., Defendant.	C.A. No. 04-1522-GMS

DEFENDANT'S FIRST SUPPLEMENTAL RESPONSES TO PLAINTIFF'S FIRST SET OF INTERROGATORIES

Pursuant to Rules 26 and 33 of the Federal Rules of Civil Procedure, the defendant, DakoCytomation California Inc. ("DakoCytomation"), hereby provides the following First Supplemental Responses to Plaintiff Ventana Medical Systems' ("Ventana") First Set of Interrogatories.

GENERAL OBJECTIONS

DakoCytomation objects to these interrogatories to the extent that they impose requirements that are inconsistent with or exceed those specified by the Federal Rules of Civil Procedure and applicable Local Rules.

DakoCytomation objects to these interrogatories to the extent that they call for documents or information that are subject to the attorney-client privilege, attorney work product protection, or are otherwise immune from discovery.

DakoCytomation objects to these interrogatories to the extent that they seek confidential, trade secret, proprietary, or otherwise commercially sensitive information.

DakoCytomation objects to these interrogatories as overly broad and unduly burdensome to the extent that they call for information and documents that are not relevant to any claim or defense at issue in the litigation.

DakoCytomation responds as follows. DakoCytomation California conducts all sales and marketing for the Artisan Staining System.

INTERROGATORY NO. 5:

Explain fully and completely the role and responsibilities of Nova Biomedical Corporation with respect to the Artisan.

RESPONSE:

DakoCytomation incorporates its General Objections and its Objections to Definitions and Instructions, listed above. Subject to and without waiving any of these objections, DakoCytomation responds as follows. Nova Biomedical manufactures the Artisan in its entirety, and also provides quality control testing.

INTERROGATORY NO. 6:

Identify each and every limitation of the claims of the patent-in-suit that is not present in the Artisan, explain fully and completely why each such limitation is not present, and state the factual basis for the averment in paragraph 1 of the Affirmative Defenses that "None of the claims of the '901 patent are infringed, either literally or under the doctrine of equivalents, by any of DakoCytomation's products."

RESPONSE:

DakoCytomation incorporates its General Objections and its Objections to Definitions and Instructions, listed above. In addition, DakoCytomation specifically objects to this contention interrogatory as premature. It is unduly burdensome for DakoCytomation to respond to contention interrogatories at this point in the case. "[I]f [DakoCytomation is] forced to respond, [it] may have to articulate theories of [its] case not yet fully developed." *B. Braun Medical, Inc. v. Abbott Laboratories,* 155 F.R.D. 525, 527 (E.D. Pa 1994). Furthermore, Fed. R. Civ. P. 33(c) expressly provides that a court may order that contention interrogatories "need not be answered until after designated discovery has been completed or until a pre-trial conference or

other later time." Subject to and without waiving any of these objections, DakoCytomation responds as follows.

As presently advised, the Artisan Staining System does not infringe the claims of the '901 patent because it does not satisfy the "slide having a reagent agitation zone for adding and mixing reagents thereto" element of independent claims 1 and 45. During the prosecution of the '901 patent, Ventana traversed a rejection by limiting this claim element to flat surfaces, as opposed to receptacles, such as cuvettes. The Artisan Staining System has a slide and slide clip arrangement which forms a receptacle. The receptacle appears and functions like the prior art cuvettes that Ventana argued around to secure the '901 patent. Therefore, Ventana is estopped from arguing that the '901 patent covers the Artisan Staining System. Accordingly, there is no infringement.

The Artisan Staining System also does not satisfy the "air supply means" element of independent claims 1 and 45. This is a "means-plus-function" limitation pursuant to 35 U.S.C. § 112, ¶ 6. The Artisan Staining System lacks the function of this limitation, namely an air supply means positioned adjacent to said reagent agitation zone for mixing reagents. In addition, the Artisan Staining System lacks the structure disclosed in the specification that performs the function of the limitation, or any equivalent thereof. Thus, the Artisan Staining System does not meet this claim limitation.

DakoCytomation reserves the right to supplement its response to this interrogatory as discovery proceeds.

FIRST SUPPLEMENTAL RESPONSE:

DakoCytomation incorporates its Objections listed in the above response to Interrogatory No. 6. Subject to and without waiving any of these objections, DakoCytomation responds as follows.

As presently advised, the ARTISAN Staining System does not satisfy the § 112 ¶ 6 means-plus-function limitation of claims 1 and 45. The limitation "air supply means" is construed as "a device for supplying air, comprising the nozzle." (D.I. No. 56). The device for

supplying air in the ARTISAN Staining System does not have a nozzle. Accordingly, the ARTISAN Staining System does not meet this claim limitation.

As presently advised, the ARTISAN Staining System does not satisfy the "adjacent" element of independent claims 1 and 45. The term "adjacent" is construed as "next to, but not above or beneath." (D.I. No. 56). The ARTISAN's air mixer is positioned above the reagent agitation zone and not next to the reagent agitation zone. Accordingly, the ARTISAN Staining System does not meet this claim limitation.

As presently advised, the ARTISAN Staining System does not satisfy the "a reagent carousel having a ***plurality*** of reagent container supports" and the "wherein each of the reagent container supports is arranged to accommodate a reagent container" elements of independent claims 1 and 45. The parties agreed that these claim limitations were facially plain and did not need construction. (D.I. No. 40). The claim language "plurality of reagent container supports" is drawn in the plural and therefore the limitation is met only if there is more than one reagent container support. Moreover, the claim language "a reagent container" is drawn in the singular and the claim language requires that each of the container supports accommodate a reagent container. The ARTISAN has one contiguous ring that supports all the reagent containers. Accordingly, the ARTISAN does not meet either the requirement of two or more reagent container supports nor the requirement of a reagent container support for each reagent container.

DakoCytomation reserves the right to supplement its response to this interrogatory as discovery proceeds.

INTERROGATORY NO. 7:

Identify each and every prior art reference under which any claim of the patent-in-suit is invalid pursuant to 35 U.S.C. § 102, explain fully and completely where and how each limitation of each such claim is disclosed in such prior art reference, and state the factual basis for the averment in paragraph 2 of the Affirmative Defenses that "if any of the claims of the '901 patent

ordinary skill in the art would be aware of the heating methods used for automated slide staining by other manufacturers at the time the inventions were made, as well as manual heating methods.

INTERROGATORY NO. 11:

Identify each and every opinion of counsel on which you intend to rely as a defense to a charge of willful infringement of the patent-in-suit, describe in detail the date and circumstances under which each such opinion was obtained, and describe in detail the nature and circumstances relating to your reliance (if any) on each such opinion of counsel.

RESPONSE:

DakoCytomation incorporates its General Objections and its Objections to Definitions and Instructions, listed above. DakoCytomation further objects to this interrogatory on the ground that it calls for information that is subject to the attorney-client privilege.

Dated: January 30, 2006

FISH & RICHARDSON P.C.

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EXHIBIT 6

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 97,008-Y)

In re Application of:	)	
COPELAND, et. al	)	
Serial No.: Not yet assigned	)	Group Art Unit: Not yet assigned
Filed: May 2, 2002	)	Examiner: Not yet assigned
For: Automated Biological Reaction Apparatus	)	

3/A
C/7.
6/12/06

Commissioner for Patents
Washington, DC 20231

10217463.050202

PRELIMINARY AMENDMENT

Dear Sir:

IN THE SPECIFICATION

Please amend the specification as follows. A marked up version of the amended claims, to show all the changes, is attached hereto on pages separate from the amendment in accordance with 37 CFR 1.121(b).

Please delete lines 3-5 at page 1 and insert the following therefor:

This is a continuation of application Serial No. 09/931,513, filed August 16, 2001, pending, which is a continuation of application Serial No. 09/452,309, filed December 1, 1999, U.S. Patent No. 6,352,861, which is a continuation of application Serial No. 08/906,678, filed August 5, 1997, abandoned, which is a continuation of application Serial No. 08/479,415, filed June 6, 1995, U.S. Patent No. 5,654,200, which is a division of application Serial No. 352,966, filed December 9, 1994, U.S. Patent No. 5,595,707, which is a continuation of application Serial No. 924,052, filed August 31, 1992,

abandoned, which is a continuation-in-part of application Serial No. 488,601, filed March 2, 1990, abandoned.

After page 12, line 10, please insert the following paragraph:

FIG. 34 is a schematic of a jet drain for draining liquid from an upper surface of a slide.

At page 41, lines 3-8, please amend the text as follows:

Immunohistogical methods for which the apparatus of this invention are particularly suitable are described in concurrently filed, commonly assigned patent application Serial No. 07/488,601, filed March 2, 1990, now abandoned (Attorney Docket No. 193.0007), the entire contents of which are hereby incorporated by reference.

IN THE CLAIMS:

Please cancel claims 1-71 without prejudice. Please add the following claims 72-115 as follows. A marked up version of the amended claims, to show all the changes, is attached hereto on pages separate from the amendment in accordance with 37 CFR 1.121(c)(1)(ii).

72. (New claim) A biological reaction apparatus for dispensing a selected reagent to a slide containing a sample, said biological reaction apparatus comprising:

a reagent carousel having a plurality of reagent container supports thereon;

homing and indexing device, operatively coupled to the reagent carousel, for identifying the position of each reagent container support with reference to a home position;

motor engaging the reagent carousel and operatively coupled to said homing and indexing device, for rotating the reagent carousel and positioning a preselected reagent container support in a reagent supply zone;

a sample carousel arranged beneath said reagent carousel for cooperation therewith, and having a plurality of slide supports with each slide support engaging a slide having a substantially planar support surface; and

air mixer positioned adjacent an air agitation zone for mixing reactants when in the air agitation zone,

wherein said reagent supply zone is oriented so that reagent in a container in said preselected reagent container support is dispensable to a slide and wherein each of the reagent container supports is arranged to accommodate a reagent container such that it is positioned above a slide when in the reagent supply zone whereby the reagent is dispensable from a lower end of said container onto a slide.

73. (New claim) The biological reaction apparatus of claim 72, wherein said sample carousel may be arranged to allow said sample supports to be positioned in said reagent supply zone.

74. (New claim) The biological reaction apparatus of claim 72, wherein the reagent carousel is rotatably mounted on a reagent carousel support, and

wherein the homing and indexing device further comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the reagent carousel, and the other of the object and said proximity detector being mounted on the reagent carousel support in a position adjacent the path of the other.

75. (New claim) The biological reaction apparatus of claim 74, wherein said object is metallic and mounted on the reagent carousel, and

wherein the proximity detector is a metal proximity detector mounted on the reagent carousel support.

76. (New claim) The biological reaction apparatus of claim 75, wherein the reagent carousel is rotatably mounted on a reagent carousel support, the reagent carousel has a bar code zone, and

wherein the homing and indexing device further comprises a bar code reader mounted on the reagent carousel support in a position to read a bar code on a reagent container positioned in the bar code zone, whereby a bar code identifying the contents of a reagent container in the respective reagent container support can be read with reference to said home position by the bar code reader, and the reagent container containing said identified reagent can be automatically positioned in the reagent supply zone.

77. (New claim) The biological reaction apparatus of claim 76, further comprises a reagent delivery actuator positioned for engaging a reagent container positioned in the reagent delivery zone and initiating delivery of a predetermined volume of reagent from the reagent container to said slide.

78. (New claim) The biological reaction apparatus of claim 77, wherein the motor comprises a stepper motor having a rotational mode for rotating the reagent carousel and a braking mode resisting rotation of the reagent carousel.

79. (New claim) The biological reaction apparatus of claim 78, wherein the reagent carousel comprises a reagent support tray removably supported by a reagent tray support, the reagent support tray has indexing support feet on an underside thereof, the reagent tray support has receptors for the indexing support feet in an upper surface thereof, whereby the reagent support tray can be removed from the reagent tray support for reloading or refrigerated storage and can be replaced on the reagent support tray in the same indexed position.

80. (New claim) The biological reaction apparatus of claim 79, wherein each sample support comprises a slide support plate having a distal end, a proximal end and a slide support surface, the distal end having raised terminal and lateral distal guide tabs with guide tab termini, the proximal end having first and second lateral guides with opposed surfaces for engaging the lateral edges of a slide, the distance between the slide support surface and the guide tab termini being less than a microscope slide thickness.

81. (New claim) The biological reaction apparatus of claim 80, wherein the slide support plate comprises a distal support section at the distal end and a proximal support section at the proximal end, the proximal support section comprising an inflexible support and a flexible arm with opposed lateral edges, and the distance between the slide engaging surfaces is less than a microscope slide width, whereby the slide engaging surfaces apply a positive pressure against the edges of a slide engaged therewith.

82. (New claim) The biological reaction apparatus of claim 81, wherein the distance between the slide engaging surfaces is from 20 to 24mm.

83. (New claim) The biological control apparatus of claim 82, further including a pivot support with a pivot axis, wherein the slide support plate is pivotally mounted on the pivot support for rotation around the pivot axis from a horizontal position to a slide draining position.

84. (New claim) The biological reaction apparatus of claim 83, wherein the pivot axis is defined by a pivot rod and a pivot rod receptor in sliding engagement therewith, one of the pivot rod and the pivot rod receptor being attached to or integral with the slide support and the other of the pivot rod and pivot rod receptor being attached to or integral with the pivot support.

85. (New claim) The biological reaction apparatus of claim 84, wherein the pivot axis is defined by two pivot rods and pivot rod receptors.

86. (New claim) The biological reaction apparatus of claim 82, wherein the slide support surface slopes downward from the proximal end to the distal end, the plane of the slide support surface forming an angle with the pivot axis of from 0.3 to 1 degree.

87. (New claim) The biological reaction apparatus of claim 83, wherein the slide support includes a lateral tilt cam surface for engagement by a tilt actuator.

88. (New claim) The biological reaction of claim 83, further comprising a rotational bias means for retaining the support surface in the substantially horizontal position when the tilt cam surface is not engaged by a tilt actuator.

89. (New claim) The biological reaction apparatus of claim 88 characterised in that the rotational bias means is a spring.

90. (New claim) The biological reaction apparatus of claim 83, wherein the pivot support has a pivot stop means positioned to abut a surface of the slide support for stopping pivotal rotation of the slide support when it has been pivoted to the slide draining position.

91. (New claim) The biological reaction apparatus of claim 73, wherein the homing and indexing device is operatively coupled to the slide support carousel, for identifying the position of each said slide support with reference to a home position; and

wherein the motor, engaging the slide support carousel and operatively coupled to said homing and indexing device, rotates the slide support carousel and positions a slide support in a reagent delivery zone.

92. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,

wherein the homing and indexing device comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the slide support carousel, and the other of the object and said proximity detector being mounted on the slide carousel support in a position adjacent the path of the other.

93. (New claim) The biological reaction apparatus of claim 93, wherein said object is metallic and mounted on the slide support carousel and the proximity detector is a metal proximity detector mounted on the slide carousel support.

94. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,

wherein the slide support carousel has a bar code zone, and

wherein the homing and indexing device comprises a bar code zone, reader mounted on the slide carousel support in a position to read a bar code on a slide positioned in the bar code zone.

95. (New claim) The biological reaction apparatus of claim 91, characterised in that the motor comprises a stepper motor having a rotational mode for rotating the slide support carousel and a braking mode resisting rotation of the slide support carousel.

96. (New claim) The biological reaction apparatus of claim 95, further comprising a heating device for heating the samples.

97. (New claim) The biological reaction apparatus of claim 96, wherein the heating device comprises an air supply chamber communicating with the air distribution manifold, start-up and operational heating means positioned in the path of air passing from the air supply chamber to the air distribution manifold, the start-up heating means comprising means for heating air until the heating chamber has reached an operational temperature, and the operational heating means comprising means for heating air until the heating chamber has reached said operational temperature and for intermittently heating air thereafter to maintain the heating chamber at an operational temperature.

98. (New claim) The biological reaction apparatus of claim 97, wherein the heating device includes a fan positioned to force air into the air distribution manifold through the air supply chamber,

said fan including air temperature responsive means for increasing the rotational speed of said fan when the air temperature entering the air distribution manifold falls below a desired operational temperature.

99. (New claim) The biological reaction apparatus of claim 96, further comprising a temperature sensing device positioned in the path of heated air entering the air distribution manifold for detecting the temperature of said heated air.

100. (New claim) The biological reaction apparatus of claim 99, wherein the temperature sensing device is a thermistor encased in a heat sensitivity reducing jacket.

101. (New claim) The biological reaction apparatus of claim 72, further comprising a rinse station, a rinse solution applicator positioned adjacent the rinse station, the rinse solution applicator comprising at least one nozzle positioned for directing a stream of rinse liquid onto a rinse solution impact zone of a sample support.

102. (New claim) The biological reaction apparatus of claim 72, further comprising an evaporation inhibiting liquid application station, evaporation inhibiting liquid applicator positioned adjacent the application station, the evaporation inhibiting liquid applicator comprising at least one nozzle positioned for directing a stream of evaporation inhibiting liquid onto a preselected evaporation inhibiting liquid impact zone of a sample support.

103. (New claim) An automated biological reaction apparatus of claim 102, wherein the evaporation inhibiting liquid application station is in the reagent delivery zone.

104. (New claim) The biological reaction apparatus of claim 72, wherein the air mixer includes a vortex agitation mixer having a nozzle for directing air at the air agitation zone, said sample support being positionable in the air agitation zone.

105. (New claim) The biological reaction apparatus of claim 104, wherein the vortex agitation mixer comprises a nozzle for applying at least one gas stream to an off-center area of the surface of liquid on a slide in the air agitation zone.

106. (New claim) The biological reaction apparatus of claim 105, wherein the vortex agitation mixer comprises a first nozzle adjacent to a distal end of a slide support in the air agitation zone for directing a first gas stream to a first off-center area of the surface of the liquid on a slide in the air agitation zone, and a second nozzle adjacent to a proximal end of a slide support in the air agitation zone for directing a second gas stream to a second off-center area of the surface of the liquid on a slide in the air agitation zone, the first and second gas streams being in opposite directions and the first and second off-center areas being on opposite sides of the center of the surface of a liquid on a slide in the air agitation zone.

107. (New claim) The biological reaction apparatus of claim 72, further comprising apparatus for providing a sample rinse liquid within a selected temperature range, such apparatus comprising:

a container for receiving liquid;

temperature regulator, operatively mounted on said container, for maintaining liquid in the container within a selected temperature range; and

means, operatively coupled to said container, for delivering liquid at a temperature within said selected temperature range from the container to said sample.

108. (New claim) The biological reaction apparatus of claim 107, further comprising a safety thermostat connected to the heating device for terminating a flow of power to the heating device if the temperature of the container exceeds a predetermined safety limit.

109. (New claim) The biological reaction apparatus of claim 94, further comprising a bar code cleaner for cleaning bar codes on the slides.

110. (New claim) The biological reaction apparatus of claim 108, further comprising draining means for draining rinse solution from a sample.

111. (New claim) The biological reaction apparatus of claim 110, characterised in that the drain means comprises a jet drain for directing a jet of fluid across an upper surface of a slide.

112. (New claim) The biological reaction apparatus of claim 108, wherein the rinse solution applicator comprises a first rinsing means at a beginning of the rinse zone and a second rinsing means at an end of the rinse zone.

113. (New claim) The biological reaction apparatus of claim 112, wherein the first rinsing means includes at least one nozzle for depositing a layer of rinse liquid onto an upper surface of a slide positioned at the beginning of the rinse zone and the second rinsing means includes sweeping means for sweeping the layer of rinse liquid off of the slide when the slide reaches the end of the rinse zone.

114. (New claim) The biological reaction apparatus of claim 113, wherein the first rinsing means and the second rinsing means are spaced from one another so that a predetermined period of time transpires during the transport of the slide between the first and second rinsing means before the layer of rinse liquid is swept off of the slide.

115. (New claim) The biological reaction apparatus of claim 114, wherein the sweeping means of the second rinsing means comprises fluid pulsing means for forming pulsed streams of rinse liquid, alternately directed at one and then an other of longitudinal edges of the slides, to sweep the layer of rinse liquid off of the slide.

Respectfully submitted,

McDonnell Boehnen Hulbert & Berghoff

By: _____
Amir N. Penn, Reg. No. 40,767
Attorney for Applicant

DATED: 5/02/02

APPENDIX UNDER 37 CFR 1.121(b)

IN THE SPECIFICATION:

Please delete lines 3-5 at page 1 and insert the following therefor:

This is a continuation of application Serial No. 09/452,309, filed on December 1, 1999, pending, which is a continuation of application Serial No. 08/906,678, filed August 5, 1997, abandoned, which is a continuation of application Serial No. 08/479,415, filed June 6, 1995, U.S. Patent No. 5,654,200, which is a division of application Serial No. 352,966, filed December 9, 1994, U.S. Patent No. 5,595,707, which is a continuation of application Serial No. 924,052, filed August 31, 1992, abandoned, which is a continuation-in-part of application Serial No. 488,601, filed March 2, 1990, abandoned.

After page 12, line 10, please insert the following paragraph:

FIG. 34 is a schematic of a jet drain for draining liquid from an upper surface of a slide.

At page 41, line 6, change "_____, filed March 2, 1990" to --07/488,601, filed March 2, 1990, now abandoned--, such that the sentence reads "Immunohistogical methods for which the apparatus of this invention are particularly suitable are described in concurrently filed, commonly assigned patent application Serial No. 07/488,601, filed March 2, 1990, now abandoned (Attorney Docket No. 193.0007), the entire contents of which are hereby incorporated by reference."

APPENDIX UNDER 37 CFR 1.121(c)

IN THE CLAIMS:

72. (New claim) A biological reaction apparatus for dispensing a selected reagent to a slide containing a sample, said biological reaction apparatus comprising:

a reagent carousel having a plurality of reagent container supports thereon;

homing and indexing device, operatively coupled to the reagent carousel, for identifying the position of each reagent container support with reference to a home position;

motor engaging the reagent carousel and operatively coupled to said homing and indexing device, for rotating the reagent carousel and positioning a preselected reagent container support in a reagent supply zone;

a sample carousel arranged beneath said reagent carousel for cooperation therewith, and having a plurality of slide supports with each slide support engaging a slide having a substantially planar support surface; and

air mixer positioned adjacent an air agitation zone for mixing reactants when in the air agitation zone,

wherein said reagent supply zone is oriented so that reagent in a container in said preselected reagent container support is dispensable to a slide and wherein each of the reagent container supports is arranged to accommodate a reagent container such that it is positioned above a slide when in the reagent supply zone whereby the reagent is dispensable from a lower end of said container onto a slide.

73. (New claim) The biological reaction apparatus of claim 72, wherein said sample carousel may be arranged to allow said sample supports to be positioned in said reagent supply zone.

74. (New claim) The biological reaction apparatus of claim 72, wherein the reagent carousel is rotatably mounted on a reagent carousel support, and

wherein the homing and indexing device further comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the reagent carousel, and the other of the object and said proximity detector being mounted on the reagent carousel support in a position adjacent the path of the other.

75. (New claim) The biological reaction apparatus of claim 74, wherein said object is metallic and mounted on the reagent carousel, and

wherein the proximity detector is a metal proximity detector mounted on the reagent carousel support.

76. (New claim) The biological reaction apparatus of claim 75, wherein the reagent carousel is rotatably mounted on a reagent carousel support, the reagent carousel has a bar code zone, and

wherein the homing and indexing device further comprises a bar code reader mounted on the reagent carousel support in a position to read a bar code on a reagent container positioned in the bar code zone, whereby a bar code identifying the contents of a reagent container in the respective reagent container support can be read with reference to said home position by the bar code reader, and the

reagent container containing said identified reagent can be automatically positioned in the reagent supply zone.

77. (New claim) The biological reaction apparatus of claim 76, further comprises a reagent delivery actuator positioned for engaging a reagent container positioned in the reagent delivery zone and initiating delivery of a predetermined volume of reagent from the reagent container to said slide.

78. (New claim) The biological reaction apparatus of claim 77, wherein the motor comprises a stepper motor having a rotational mode for rotating the reagent carousel and a braking mode resisting rotation of the reagent carousel.

79. (New claim) The biological reaction apparatus of claim 78, wherein the reagent carousel comprises a reagent support tray removably supported by a reagent tray support, the reagent support tray has indexing support feet on an underside thereof, the reagent tray support has receptors for the indexing support feet in an upper surface thereof, whereby the reagent support tray can be removed from the reagent tray support for reloading or refrigerated storage and can be replaced on the reagent support tray in the same indexed position.

80. (New claim) The biological reaction apparatus of claim 79, wherein each sample support comprises a slide support plate having a distal end, a proximal end and a slide support surface, the distal end having raised terminal and lateral distal guide tabs with guide tab termini, the proximal end having first and second lateral guides with opposed surfaces for engaging the lateral edges of a slide, the distance between the slide support surface and the guide tab termini being less than a microscope slide thickness.

81. (New claim) The biological reaction apparatus of claim 80, wherein the slide support plate comprises a distal support section at the distal end and a proximal support section at the proximal end, the proximal support section comprising an inflexible support and a flexible arm with opposed lateral edges, and the distance between the slide engaging surfaces is less than a microscope slide width, whereby the slide engaging surfaces apply a positive pressure against the edges of a slide engaged therewith.

82. (New claim) The biological reaction apparatus of claim 81, wherein the distance between the slide engaging surfaces is from 20 to 24mm.

83. (New claim) The biological control apparatus of claim 82, further including a pivot support with a pivot axis, wherein the slide support plate is pivotally mounted on the pivot support for rotation around the pivot axis from a horizontal position to a slide draining position.

84. (New claim) The biological reaction apparatus of claim 83, wherein the pivot axis is defined by a pivot rod and a pivot rod receptor in sliding engagement therewith, one of the pivot rod and the pivot rod receptor being attached to or integral with the slide support and the other of the pivot rod and pivot rod receptor being attached to or integral with the pivot support.

85. (New claim) The biological reaction apparatus of claim 84, wherein the pivot axis is defined by two pivot rods and pivot rod receptors.

86. (New claim) The biological reaction apparatus of claim 82, wherein the slide support surface slopes downward from the proximal end to the distal end, the plane of the slide support surface forming an angle with the pivot axis of from 0.3 to 1 degree.

87. (New claim) The biological reaction apparatus of claim 83, wherein the slide support includes a lateral tilt cam surface for engagement by a tilt actuator.

88. (New claim) The biological reaction of claim 83, further comprising a rotational bias means for retaining the support surface in the substantially horizontal position when the tilt cam surface is not engaged by a tilt actuator.

89. (New claim) The biological reaction apparatus of claim 88 characterised in that the rotational bias means is a spring.

90. (New claim) The biological reaction apparatus of claim 83, wherein the pivot support has a pivot stop means positioned to abut a surface of the slide support for stopping pivotal rotation of the slide support when it has been pivoted to the slide draining position.

91. (New claim) The biological reaction apparatus of claim 73, wherein the homing and indexing device is operatively coupled to the slide support carousel, for identifying the position of each said slide support with reference to a home position; and

wherein the motor, engaging the slide support carousel and operatively coupled to said homing and indexing device, rotates the slide support carousel and positions a slide support in a reagent delivery zone.

92. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,

wherein the homing and indexing device comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the slide support carousel, and the other of the object and said proximity detector being mounted on the slide carousel support in a position adjacent the path of the other.

93. (New claim) The biological reaction apparatus of claim 93, wherein said object is metallic and mounted on the slide support carousel and the proximity detector is a metal proximity detector mounted on the slide carousel support.

94. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,

wherein the slide support carousel has a bar code zone, and

wherein the homing and indexing device comprises a bar code zone, reader mounted on the slide carousel support in a position to read a bar code on a slide positioned in the bar code zone.

95. (New claim) The biological reaction apparatus of claim 91, characterised in that the motor comprises a stepper motor having a rotational mode for rotating the slide support carousel and a braking mode resisting rotation of the slide support carousel.

96. (New claim) The biological reaction apparatus of claim 95, further comprising a heating device for heating the samples.

97. (New claim) The biological reaction apparatus of claim 96, wherein the heating device comprises an air supply chamber communicating with the air distribution manifold, start-up and operational heating means positioned in the path of air passing from the air supply chamber to the air distribution manifold, the start-up heating means comprising means for heating air until the heating chamber has reached an operational temperature, and the operational heating means comprising means for heating air until the heating chamber has reached said operational temperature and for intermittently heating air thereafter to maintain the heating chamber at an operational temperature.

98. (New claim) The biological reaction apparatus of claim 97, wherein the heating device includes a fan positioned to force air into the air distribution manifold through the air supply chamber, said fan including air temperature responsive means for increasing the rotational speed of said fan when the air temperature entering the air distribution manifold falls below a desired operational temperature.

99. (New claim) The biological reaction apparatus of claim 96, further comprising a temperature sensing device positioned in the path of heated air entering the air distribution manifold for detecting the temperature of said heated air.

100. (New claim) The biological reaction apparatus of claim 99, wherein the temperature sensing device is a thermistor encased in a heat sensitivity reducing jacket.

101. (New claim) The biological reaction apparatus of claim 72, further comprising a rinse station, a rinse solution applicator positioned adjacent the rinse station, the rinse solution applicator comprising at least one nozzle positioned for directing a stream of rinse liquid onto a rinse solution impact zone of a sample support.

102. (New claim) The biological reaction apparatus of claim 72, further comprising an evaporation inhibiting liquid application station, evaporation inhibiting liquid applicator positioned adjacent the application station, the evaporation inhibiting liquid applicator comprising at least one nozzle positioned for directing a stream of evaporation inhibiting liquid onto a preselected evaporation inhibiting liquid impact zone of a sample support.

103. (New claim) An automated biological reaction apparatus of claim 102, wherein the evaporation inhibiting liquid application station is in the reagent delivery zone.

104. (New claim) The biological reaction apparatus of claim 72, wherein the air mixer includes a vortex agitation mixer having a nozzle for directing air at the air agitation zone, said sample support being positionable in the air agitation zone.

105. (New claim) The biological reaction apparatus of claim 104, wherein the vortex agitation mixer comprises a nozzle for applying at least one gas stream to an off-center area of the surface of liquid on a slide in the air agitation zone.

106. (New claim) The biological reaction apparatus of claim 105, wherein the vortex agitation mixer comprises a first nozzle adjacent to a distal end of a slide support in the air agitation zone for directing a first gas stream to a first off-center area of the surface of the liquid on a slide in the air agitation zone, and a second nozzle adjacent to a proximal end of a slide support in the air agitation zone for directing a second gas stream to a second off-center area of the surface of the liquid on a slide in the air agitation zone, the first and second gas streams being in opposite directions and the first and second off-center areas being on opposite sides of the center of the surface of a liquid on a slide in the air agitation zone.

107. (New claim) The biological reaction apparatus of claim 72, further comprising apparatus for providing a sample rinse liquid within a selected temperature range, such apparatus comprising:

a container for receiving liquid;

temperature regulator, operatively mounted on said container, for maintaining liquid in the container within a selected temperature range; and

means, operatively coupled to said container, for delivering liquid at a temperature within said selected temperature range from the container to said sample.

108. (New claim) The biological reaction apparatus of claim 107, further comprising a safety thermostat connected to the heating device for terminating a flow of power to the heating device if the temperature of the container exceeds a predetermined safety limit.

109. (New claim) The biological reaction apparatus of claim 94, further comprising a bar code cleaner for cleaning bar codes on the slides.

110. (New claim) The biological reaction apparatus of claim 108, further comprising draining means for draining rinse solution from a sample.

111. (New claim) The biological reaction apparatus of claim 110, characterised in that the drain means comprises a jet drain for directing a jet of fluid across an upper surface of a slide.

112. (New claim) The biological reaction apparatus of claim 108, wherein the rinse solution applicator comprises a first rinsing means at a beginning of the rinse zone and a second rinsing means at an end of the rinse zone.

113. (New claim) The biological reaction apparatus of claim 112, wherein the first rinsing means includes at least one nozzle for depositing a layer of rinse liquid onto an upper surface of a slide positioned at the beginning of the rinse zone and the second rinsing means includes sweeping means for sweeping the layer of rinse liquid off of the slide when the slide reaches the end of the rinse zone.

114. (New claim) The biological reaction apparatus of claim 113, wherein the first rinsing means and the second rinsing means are spaced from one another so that a predetermined period of time transpires during the transport of the slide between the first and second rinsing means before the layer of rinse liquid is swept off of the slide.

115. (New claim) The biological reaction apparatus of claim 114, wherein the sweeping means of the second rinsing means comprises fluid pulsing means for forming pulsed streams of rinse liquid, alternately directed at one and then an other of longitudinal edges of the slides, to sweep the layer of rinse liquid off of the slide.